

Notice of Allowability

Application N .

09/625,421

Examiner

Bradley T King

Applicant(s)

DUMBAUGH, GEORGE D.

Art Unit

3683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the personal interview on 04/29/04.
2. ☒ The allowed claim(s) is/are 1,3-13 and 15-21.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 1/29/02.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DOUGLAS C. BUTLER
PRIMARY EXAMINER

Art Unit: 3683

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a personal interview with Richard Lazarus on 04/29/2004.

The application has been amended as follows:

Claims 1, 12 and 15 have been replaced with the attached claims 1, 12 and 15.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley T King whose telephone number is (703) 308-8346. The examiner can normally be reached on 11:00-7:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Lavinder can be reached on (703) 308-3421. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3683

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BTK


JACK LAVINDER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 8177

1. (Currently Amended): A vibratory conveying apparatus adapted to vibrate and to convey material, said vibratory conveyor apparatus including:

a bed on which the material is conveyed in a direction;

a plurality of drive springs, each said drive spring having a first end, a second end and a central axis, said first end of each said drive spring being attached to said bed, each said drive spring adapted to compress and extend along a line of stroke generally parallel to said central axis of said drive spring;

a plurality of inclined stabilizers, each said stabilizer having a first end, a second end and a longitudinal axis, said first end of each said stabilizer being attached to said bed, said longitudinal axis of each said stabilizer being generally perpendicular to said central axis of a drive spring, each said stabilizer being more rigid in a direction transverse to said line of stroke than said stabilizer is rigid in the direction of said line of stroke, said stabilizers allowing movement of each said drive spring generally parallel to said central axis of said drive spring and inhibiting movement of each said drive spring generally transversely to said central axis of said drive spring;

a first pair of rotatable eccentric weights coupled to said bed, said first pair of rotatable eccentric weights including a first rotatable eccentric weight adapted to rotate about a first axis and a second rotatable eccentric weight adapted to rotate about a second axis, said first and second axes being located substantially in a first plane and generally parallel to one another ~~and extending generally perpendicular to the direction the material is conveyed~~; and

a second pair of rotatable eccentric weights coupled to said bed, said second pair of rotatable eccentric weights including a third rotatable eccentric weight adapted to rotate about a third axis and a fourth rotatable eccentric weight adapted to rotate about a fourth axis, said third and fourth axes being located substantially in a second plane ~~extending generally perpendicular to the direction the material is conveyed~~, said first and second axes being spaced along the direction the material is conveyed from said third and fourth axes, said second plane being non-coplanar with said first plane, said rotatable eccentric weights being free-wheeling with respect to one another and adapted to rotate at substantially the same operating speed with respect to one another, each said rotatable eccentric weight adapted to provide an output force generally perpendicular to its axis of rotation, said rotatable eccentric weights adapted to accumulatively synchronize with one another such that the combined resulting output force of said first pair of rotatable eccentric weights is generally parallel to said line of stroke and the combined resulting output force of said second pair of rotatable eccentric weights is generally parallel to said line of stroke;

whereby rotation of said first pair of rotatable eccentric weights and rotation of said second pair of rotatable eccentric weights, in combination with said stabilizers, accumulatively synchronize such that the output forces of said rotatable eccentric weights and their respective power outputs accumulatively add to cause said bed to vibrate along said central axes of said drive springs.

12. (Currently Amended) A vibratory conveying apparatus adapted to vibrate and to convey material, said vibratory conveying apparatus including:

a bed on which the material is conveyed in a direction;

a counterbalance;

a plurality of isolation springs attached to said counterbalance, said isolation springs adapted to support said counterbalance;

a plurality of drive springs, each said drive spring having a first end attached to said bed, a second end attached to said counterbalance, and a central axis, each said drive spring adapted to compress and extend along a line of stroke generally parallel to said central axis of said drive spring,

a plurality of stabilizers, each said stabilizer having a first end attached to said bed, a second end attached to said counterbalance and a longitudinal axis, said longitudinal axes of said stabilizers being generally parallel to one another, each said stabilizer being more rigid in a direction transverse to said line of stroke than said stabilizer is rigid in said direction of said line of stroke, said stabilizers allowing movement of each said drive spring generally parallel to said central axis of said drive spring and inhibiting movement of each said drive spring generally transversely to said central axis of said drive spring;

a first pair of rotatable eccentric weights rotatably attached to said counterbalance, said first pair of rotatable eccentric weights including a first rotatable eccentric weight adapted to rotate about a first axis and a second rotatable eccentric weight adapted to rotate about a second axis, said first and second axes being located substantially in a first plane and generally parallel to one another ~~and extending generally parallel to the direction the material is conveyed~~; and

a second pair of rotatable eccentric weights rotatably attached to said counterbalance, said second pair of rotatable eccentric weights including a third rotatable eccentric weight adapted to rotate about a third axis and a fourth rotatable eccentric weight adapted to rotate about a fourth axis, said third and fourth axes being located substantially in a second plane ~~extending generally perpendicular to the direction the material is conveyed~~, said first and second axes being spaced along the direction the material is conveyed from said third and fourth axes, said second plane being non-coplanar with said first plane, said rotatable eccentric weights being free-wheeling with respect to one another and adapted to rotate at substantially the same operating speed with respect to one another, each said rotatable eccentric weight adapted to provide an output force generally perpendicular to its axis of rotation, said rotatable eccentric weights adapted to accumulatively synchronize with

one another such that the combined resulting output force of said first pair of rotatable eccentric weights is generally parallel to said line of stroke and the combined resulting output force of said second pair of rotatable eccentric weights is generally parallel to said line of stroke;

whereby rotation of said first pair of rotatable weights and rotation of said second pair of rotatable weights, in combination with said stabilizers, accumulatively synchronize such that the output forces of said rotatable eccentric weights and their respective power outputs accumulatively add to cause said bed to vibrate along said central axes of said drive springs.

15. (Currently Amended) A method of vibrating a conveying apparatus to convey material, said method including the steps of:

providing a bed having an inlet end and an outlet end on which material is adapted to be conveyed in a direction;

providing a plurality of drive springs, each drive spring having a first end attached to said bed and a second end attached to a support, each said drive spring adapted to compress and extend along a line of stroke;

providing a plurality of stabilizers attached to said bed, each said stabilizer being more rigid in a direction transverse to said line of stroke than said stabilizer is rigid in the direction of said line of stroke;

providing a first vibratory motor having a first rotatable eccentric weight adapted to rotate about a first axis, a second vibratory motor having a second rotatable eccentric weight adapted to rotate about a second axis, a third vibratory motor having a third rotatable eccentric weight adapted to rotate about a third axis, and a fourth vibratory motor having a fourth eccentric weight adapted to rotate about a fourth axis, ~~each said axis of said eccentric weights extending generally perpendicular to the direction the material is conveyed,~~ said first and second axis being located substantially in a first plane and said third and fourth axes being located substantially in a second plane, said second plane being non-coplanar with said first plane, said first and second axes being spaced from said third and fourth axes along the direction the material is conveyed, said eccentric weights being free-wheeling with respect to one another, each said vibratory motor adapted to operate at substantially the same operating speed and to provide an output force generally perpendicular to its axis of rotation, said rotatable eccentric weights adapted to accumulatively synchronize with one another without being rotationally coupled to one another such that the combined resulting output force of said first pair of rotatable eccentric weights is generally parallel to said line of stroke and the combined resulting output force of said second pair of rotatable eccentric weights is generally parallel to said line of stroke;

operating said vibratory motors to rotate said eccentric weights, such that said rotating eccentric weights accumulatively synchronize and accumulatively add their output forces and their respective power outputs and thereby vibrate said bed along said line of stroke at a vibration frequency; and

operating each said vibratory motor at substantially the same selected operating speed which approaches being equal to, or is less than, the natural frequency of said drive springs which are vibrating said bed.